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Activity-Based Costing System and its role in Decision Making in Gaza Strip Factories

Submitted by: Hani Omar Skaik

Supervised by: Dr. Salem Helles

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بسم الله الرحمن الرحيم

الجامعة الإسلامية - غزة
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وبعد المداولة أوصت اللجنة بمنح الباحث درجة الماجستير في **كلية التجارة / قسم إدارة الأعمال**

واللجنة إذ تمنحه هذه الدرجة فإنها توصيه بتقوى الله ولزوم طاعته وأن يسخر علمه في خدمة دينه ووطنه.

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عميد الدراسات العليا

د. مازن إسماعيل هنية

P.O.Box 108, Rimal,Gaza, Palestine Tel:(+970/8)286 3554-2823311هاتف Fax: (+970/8)2863552 فاكس ص.ب108 الرمال-غزة-فلسطين
Web Site:www.iugaza.edu e-mail: public@mail.iugaza.edu

ABSTRACT

The aim of this study is to examine the relationship between the adoption of Activity Based Costing (ABC) by factories located in Gaza Strip and the Decision Making.

A questionnaire survey was considered an appropriate method for this study. The sample was selected from the Ministry of Industry. 43 questionnaires were returned, generating an 86% response rate.

The results show that the most important decisions in Gaza Strip factories are taken for Product Quality, Product Cost, Cost of Add/delete Product Lines and Product Costing consequently costing system is a vital component for the decision makers in helping for rational decision making. Another result indicates that Gaza factories are not implementing ABC which affect negatively the decision making process.

Last, the findings suggest that the strengthening the Decision Making mechanism required a strong cost information system; this cost information system is not used in the Gaza Strip factories.

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Chapter 1

INTRODUCTION

1.1 Background

Manufacturing firms face ever-increasing competition in today's global marketplace. Companies must react quickly and manufacture high quality, low cost products to be successful in this new environment. To make proper decisions, senior managers must have accurate and up- to-date costing information. Traditional costing systems based on volume-based allocation of overhead costs have lost relevance in a manufacturing environment that has seen a sharp increase in overhead costs and a subsequent decline in direct labor. These traditional costing systems tend to distort product costs and lead to poor strategic decision making.

One innovative costing method designed to deal with the deficiencies of traditional costing systems is Activity Based Costing (ABC). ABC, pioneered by Robin Cooper, Robert Kaplan, and H. Thomas Johnson, is a costing methodology used to trace overhead costs directly to cost objects, i.e., products, processes, services, or customers and help managers to make the right decisions regarding product mix and competitive strategies.

ABC can radically change how managers determine the mix of their product line, price their products, identify the location for sourcing components, and assess new technology. (Roztocki Narcyz 1999)

Historically, manufacturing and cost accounting became linked because of the need to determine the amount of profit to be gained by selling, producing, and shipping a product. Early decisions made within this relationship fostered a certain standard upon which a method of determining the overhead cost products based upon the direct labor content was built. This made sense, because, quite simply, direct labor was a large percentage of the cost that was expended in manufacturing such products as automobiles, trains, steel, clothing, firearms, and farm implements. The procedure used became known as the traditional costing method.

The traditional costing system, established about 1925, worked well until the business environment changed. About 15 years ago, manufacturing firms began changes that were not conducive to the traditional costing method. Automated equipment that required a minimum of direct labor was installed. Continuing to use direct labor as the allocation base distorted the distribution of indirect costs.

As a result of these changes, the traditional costing system, with its one-size-fits-all approach, is not adequate for today's business situations. Not only is the traditional costing method unable to supply the tools for measuring costs, it cannot provide managers with the information needed to run manufacturing operations profitably. A costing system that will

identify the relation between costs and the activities that cause them is needed, and that information has never been available from traditional costing system (Wiersema, 1995).

1.2 Steps for Performing Activity Based Costing

Five activities had been identified that need to occur in order to determine activity costs:

1. Analyze Activities
2. Gather Costs
3. Trace Costs to Activities
4. Establish Output Measures
5. Analyze Costs

This process can take anywhere from a few days to a few months, depending on level of detail, complexity of an organization's processes, and commitment of team resources.

1.3 Gaza Strip Factories

Gaza Strip had about 4000 industrial entity according to the latest statistical report from the Palestinian Central Bureau of Statistics (PCBS), these factories are expanded all over Gaza Strip and working in all of the business industry sectors, and had a considerable contribution to the GNP in Gaza Strip.

1.4 Thesis Problem

The thesis discusses the deficiencies of product costing information which support the rationale decision making for management that helps the decision makers in defining the product mix, marketing plans, pricing policies, this lack of rationale decision making revealed as a result of deficiency of costing system which helps in define accurate product costs, the Activity Based Costing System is a superior tool that provides a good information for rationale decision making.

1.5 Study Questions

Seeing that the purpose of this study is to examine the use of the Activity Based Costing System by Gaza Strip factories for rationale decision making, this aim generates:

Hypothesis 1: The costing systems in the Gaza Strip factories do not provide competent tool for rational decision making.

In addition, this study will examine the use of costing systems as well as implementing ABC. This aim leads to Hypothesis 2.

Hypothesis 2: The Gaza Strip factories do not implement Activity Based Costing System.

1.6 Study Objective

This study aimed to examine the implementation of ABC in Gaza Strip factories and its role for rationale decision making.

It was expected that the achievement of that objective would involve an investigation of the following matters:

- The degree of adoption of ABC by Gaza Strip factories;
- The relationship between the costing systems and its role in decision making.

1.7 Study Justification

This study will explore the Implantation of ABC in the Gaza Strip factories, as well as the role of the ABC in rationale decision making for decision makers.

It is expected that this study will shed light on the weighting of those variables and of their relative importance thus modifying the current theory of ABC. In addition, this study is expected to make important contributions with both practical and theoretical implications for ABC in Gaza Strip and to fill the gaps caused by the failure of the existing theory to account for the difference between countries in the region, because it is unclear whether the success/failure of implementation of ABC is attributable to culture or merely the stage of economic development.

It is also intended that this study will improve the chances of successful implementation of this and perhaps other management innovations by deepening knowledge about the factors which inhibit or facilitate implementation, and will lead to better informed management and, hence, more efficient and competitive firm with enhanced economic and social benefits. This could be very important in Gaza Strip.

Chapter 2

ACTIVITY BASED COSTING LITERATURE

2.1 The Need for Cost Systems

Companies need cost systems to perform a number of different functions. They include:

1. allocating costs between cost of goods sold and inventories for periodic internal and external profit reporting;
2. providing relevant cost information to manage the cost and mix of existing activities, products, services, locations and customers;
3. providing economic feedback to managers to manage costs and improve the efficiency and effectiveness of existing operations;
4. providing relevant information to manage the cost and mix of future activities

The first three functions relate to generating information relating to existing activities.

Inventory valuation normally is not an issue for many non-manufacturing organizations. Thus, a costing system to perform the first function is not required by many organizations.

The second function is concerned with ensuring that only profitable activities are undertaken. The costing system plays a crucial role here in generating information for periodic profitability analysis for distinguishing between profitable and unprofitable

activities. When unprofitable activities are identified cost reduction alternatives, such as outsourcing or redesign, are considered. If cost reduction or actions taken to generate additional revenues cannot make these activities profitable, and there are no other strategic reasons (such as maintaining a full product line) for continuing the activities, they are likely to be subjected to discontinuation. In some situations cost information extracted from the costing system also plays a crucial role in determining selling prices, particularly in thin markets where customized products are provided that do not have readily available market prices.

The third function relates to operational cost control and includes traditional responsibility accounting, standard costing and variance analysis.

Whereas the first three functions are mainly feedback oriented the fourth function relies on feed forward techniques. Here the focus is on managing future activities to ensure that only profitable new products or services are launched. The existing costing database is unlikely to be directly appropriate for this function. Instead, the emphasis is on providing estimates of future costs of new activities using techniques such as target costing, life cycle costing and value engineering. Where the introduction of new activities requires initial investment outlays they are likely to be subject to a capital investment appraisal using discounted cash flow techniques. (Tayles & Drury, 2003)

2.2 Types of Cost Systems

Costing systems can vary in terms of which costs are assigned to cost objects and their level of sophistication. Typically cost systems are classified as follows:

1. Direct costing system;
2. Traditional absorption costing systems;
3. Activity-based costing systems.

3.2.1 Direct Costing Systems

Direct costing systems only assign direct costs to cost objects. Hence they report contributions to indirect costs. They are appropriate for decision-making where the cost of those joint resources that fluctuate according to the demand for them are insignificant. Negative or low contribution items should then be highlighted for special studies. An estimate of those indirect costs that are relevant to the decision should be incorporated within the analysis at the special study stage. The disadvantage of direct costing systems is that systems are not incorporate indirect costs into the analysis at the special studies stage must be based on guesswork and arbitrary estimates. Direct costing systems can therefore only be recommended where indirect costs are a low proportion of an organization's total costs (Drury, 2000).

3.2.2 Traditional Absorption Costing Systems

Full absorption costing (also referred to as full costing and absorption costing) is a traditional method where all manufacturing costs are capitalized in the inventory, i.e., charged to the inventory and become assets. This means that these costs do not become expenses until the inventory is sold. In this way, matching is more closely approximated. All selling and administrative costs are charged to expense however. Technically, full absorption costing is required for external reporting, although many companies apparently use something less than a pure full absorption costing system. The full absorption method is also frequently used for internal reporting (http://www.maaw.info/5partsofcostsystem.htm).

3.2.3 Activity-Based Costing Systems

ABC systems assign costs to products on the basis of multiple cost drivers. In addition to the conventional volume-related drivers, volume-unrelated drivers are included also. This contrasts to traditional cost systems that usually apply only one allocation basis. This basis is typically direct labor or machine hours, which are both proportional to production volume (Noreen, 1991). ABC was developed as an improved full-cost, unit calculation procedure. There is some confusion concerning the distinction between traditional cost systems and ABC-systems (Noreen, 1991). Following Noreen, traditional cost systems are merely ABC-systems that are poorly designed. ABC subsumes conventional procedures for determining product costs. It should be mentioned, however, that conventional cost

systems in Noreen's terminology closely resemble full-cost models with a limited set of unit-level cost drivers (Borgen, 2001).

2.3 The Role of a Cost Accumulation in Decision Making

Drury (2000) states: There are three main reasons why a cost accumulation system is required to generate relevant cost information for decision-making. They are:

1. Many indirect costs are relevant for decision-making;
2. An attention-directing information system is required to identify those potentially unprofitable products that require more detailed special studies;
3. Product decisions are not independent.

There is danger that only those incremental costs that are uniquely attributable to individual products will be classified as relevant for decision-making. Direct costs are transparent and how they will be affected by decisions is clearly observable. In contrast, how indirect costs will be affected by decisions is not clearly observable. There has been a tendency in the past to assume that these costs are fixed and irrelevant for decision-making. In many organizations, however, these are costs that have escalated over the years.

The message is clear- they cannot be assumed to be fixed and irrelevant for decision-making. The costs of many joint resources fluctuate in the long term according to the demand for them. The cost of support functions falls within this category. They include

activities such as materials procurement, materials handling, production scheduling, warehousing, expediting and customer order processing.

The costs of these activities are either not directly traceable to products, or would involve such detailed tracing, the costs of doing so would far exceed their benefits. Product introduction, discontinuation, redesign and mix decisions determine the demand for support function resources. For example, if a decision results in a 10% reduction in the demand for the resources of a support activity then we would expect, in the long term, for some of the costs of that's support activity to decline by 10%. Therefore, to estimate the impact that decisions will have on the support activities (and their future costs) a cost accumulation system is required that assigns indirect costs, using cause-and-effect allocations, to products.

For decision-making it could be argued that relevant costs need only be ascertained when the need arises. For example, why not undertake special studies at periodic intervals to make sure that each product is still profitable? Estimates could be made only when undertaking a special study of those relevant costs that would be avoided if a product was discontinued. This approach is fine for highly simplified situations where an organization only produces a few products and where all relevant costs are uniquely attributable to individual products. However, most organizations produce hundreds of products and the rang of potential decisions to explore undertaking special studies is enormous and unmanageable.

For example, Kaplan (1990) considers a situation where a company has 100 products and outlines the difficulties of determining which product, or product combinations, should be selected for undertaking special studies. Kaplan (1990) states:

> *"First how do you think about which product you should even think about making a decision on? There are 100 different products to consider. But think about all the* combinations *of these products: which two products, three products or groupings of 10 or 20 products should be analyzed? It's a simple exercise to calculate that there are 2100 different combinations of the 100 products … so there is no way to do an incremental revenue/incremental analysis on all relevant combinations." (Kaplan, 1990)*

To cope with the vast number of potential product combination organizations need attention-directing information to highlight those specific products, or combination of products, that appear to be questionable and which require further detailed special studies to ascertain their viability. Periodic product profitability analysis meets this requirement. A cost accumulation system is therefore required to assign costs to products for periodic profitability analysis.

The third reason for using a cost accumulation system is that many product related decisions are not independent. Consider again those joint resources shared by most products and that fluctuate in the longer term according to the demand for them. If we focus only on individual products and assume that they are independent, decisions will be

taken in isolation of decisions made on other products. For joint resources the incremental/ avoidable costs relating to a decision to add or drop a single product may be zero. Assuming that 20 products are viewed in this manner then the sum of the incremental costs will be zero. However, if the 20 products viewed as whole there may be a significant change in resource usage and incremental costs for those joint resources that fluctuate according to the demand for them.

Cooper (1990) also argues that decisions should not be viewed independently. He states:

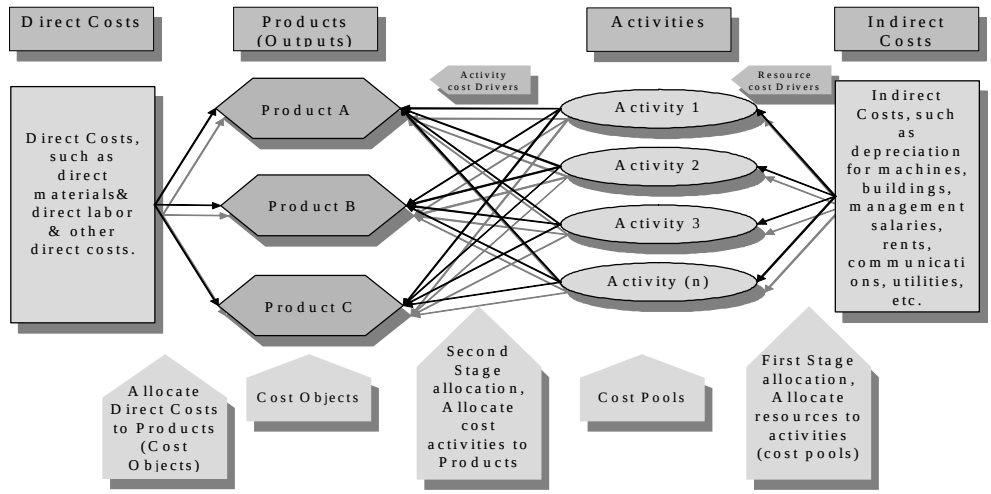
> "The decision to drop one product will typically not change 'fixed' overhead spending. In contrast, dropping 50 products might allow considerable changes to be made, Stated somewhat tritely, the sum of the parts (the decision to drop individual products) is not equal to the sum of the whole (the realizable saving from having dropped 50 products). To help them make effective decisions, managers require cost systems that provide insights into the whole, not just isolated individual parts." (Cooper, 1990)

Thus, where product decisions are not independent the multiplication of product costs, which include the cost of joint resources, by the units lost from ceasing production (or additional units from introducing a new product) may provide an approximation of the change in the long term of total company costs arising from the decisions. The rational for this is that the change in resource consumption will ultimately be followed by a change in the cash flow pattern of the organization because organizations make product introduction

or abandonment decisions for many products rather than just a single product (Drury, 2000).

2.4 The Introduction of ABC

Chongruksut, 2002 States that: Over the last three decades, competition has forced corporations to have incessant development in all aspects of business, including performance measurement and cost management. In the past, increasing capital intensity, because of automation, had changed the relationship between indirect cost and direct labor cost in a number of industries. The proportion of direct labor cost (variable costs) had contracted considerably, on the other hand; fixed costs had grown (Mills and Cave 1990; Raffish 1991; Morrow 1992; Ferrara 1994; Chung et al. 1997). Therefore, using direct labor, a small proportion of total manufacturing costs, to allocate indirect costs in the traditional cost systems was considered to be incorrect (Kaplan 1988; Cooper and Kaplan 1988; Dugdale 1990; Turney 1996).



Source: Drury, 2000

Activity Based Costing Model

Consequently, the activity-based costing technique has been substantially developed in the last decade (Cooper 1990; Morrow 1992) because it is claimed to avoid the deficiencies of the traditional absorption costing methods, which commonly use direct labor to assign indirect costs (Kaplan 1988; Dugdale 1990). It is also claimed that it can provide more precise information about the cost of the product than the traditional cost systems can, in particular, when manufacturing processes are intricate or products are produced in varying volume because the ABC system allocates indirect costs, such as utilities or maintenance, to the products that consume the resources (Krumwiede and Roth 1997).

The ABC system has been extended to cover non-production costs, which are not related to production or which emerge from operation, such as distributing and selling costs (Innes and Mitchell 1991). Then, cost driver measurements of ABC (used as non-financial

measures), such as on-time deliveries or inventory turnover, help operational control, cost control and decision-making. Finally, it provides basic information for the budgeting process (Innes and Mitchell 1991).

Johnson (1990, p.15) states that:

> '…ABC certainly ranks as one of the two or three most important management accounting innovations of the twentieth century'.

Nevertheless, Kaplan (1988; 1990) and Johnson and Kaplan (1991) point out that using a single cost system is not sufficient for companies in the competitive environment. The cost system has three essential and different functions: inventory valuation for financial and tax statements; operational control; and product-cost measurement (Kaplan 1988). The financial reporting system is beneficial for external reporting but it does not provide the performance measurement and product-cost information for managers. Although the traditional standard cost system arranges information with respect to inventory valuation and operational control, it cannot report accurate product-cost information. An ABC system can provide information on both product costs and customer profitability analysis, but not information on actual expenses for periodic financial statements (Kaplan 1990).

Accordingly, Kaplan (1990) suggests that companies should integrate information from the operational control systems and activity-based systems. He demonstrates that the ABC system provides budgets for operating departments rooted in forecasts of product volume

and product mix. At the same time, the operational control system compares actual expense to forecasted expense provided by the ABC system.

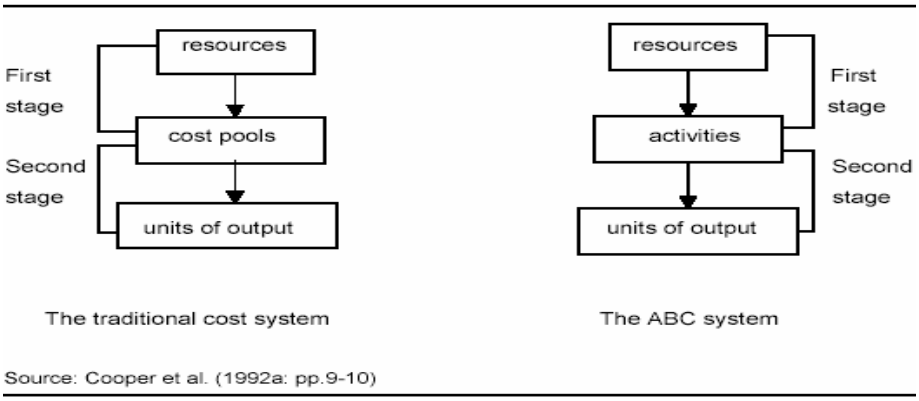
2.5 The Nature of ABC

ABC is a management accounting process that allocates resource costs to products or customers based on activities, which are the factors causing work and incurring cost, used by products or customers (O'Guin 1991, Atkinson et al. 1995; Turney 1996; Krumwiede and Roth 1997). In other words, ABC assigns costs to products according to the activities and resources consumed in producing, marketing, selling, delivering and servicing the product (Turney 1996). The heart of ABC is the activity concept (Turney 1991). ABC assumes that activities originate cost and that outputs build the demand for activities (Turney 1996). An ABC system is designed to eliminate boundaries among departments (Dugdale 1990; Morrow 1992) and to create more exact cost information or to disclose 'the hidden profits and the hidden losses' (Argyris and Kaplan 1994).

Innes and Mitchell (1998) state that both traditional cost systems and ABC systems have similar frameworks but that they have differences in indirect cost allocations. Indirect costs or support costs, such as purchasing materials, machine maintenance and so on, are costs that cannot be easily identified with individual products (Atkinson et al. 1995). Cooper et al. (1992) illustrate that, first, the indirect and support costs in traditional cost systems are allocated to cost pools and, next, the costs in cost pools are allotted to the products or customers by using a few bases that are proportional to the volume of product-units

produced, although many indirect and support resources (such as set-up cost, process engineering cost and so on) are not employed in proportion to the volume of product-units produced. Thus, cost in traditional cost systems is misrepresented. In contrast, indirect costs in ABC systems are assigned to activities based on the activity's use of resources and cost allocation of each activity into products or customers is based on work volume measures relating to specific product lines, so-called 'cost drivers' (Cooper et al. 1992a; Miller 1996; Baxandale 1999).

2.6 ABC Versus Traditional Costing Systems



Source: Cooper et al. (1992a: pp.9-10)

The previous diagram compares the traditional cost systems to the ABC system. Both methods have differences not only in the nature of allocation bases, but also in the number of allocation bases utilized to assign costs in the second stage. The traditional cost system employs three common allocation bases, such as direct labor hours, machine hours and material dollars, whereas ABC utilizes many allocation bases, such as set-up hours, number of times ordered, number of times and led and other transaction-related bases (Cooper 1988).

Consequently, product costs of the ABC system are claimed to have more accuracy than those of the traditional cost systems (Kaplan 1988; Cooper 1988; Dugdale 1990; Innes and Mitchell 1991; Morrow 1992; Turney 1996; Krumwiede and Roth 1997).

Cooper (1988) explored the effect of diverse volume and size of products on reported product costs by comparing the traditional cost system with the ABC system. He found that the traditional cost system, which is based on volume of product-units, distorts product costs, especially when engaging in product diversity in the form of size or volume.

2.7 The Benefits of ABC

ABC is claimed to furnish many significant benefits over traditional costing techniques: enhanced product cost accuracy; more comprehensive cost information for performance measurement; more pertinent data for management's decision-making; more potential for sensitivity analysis; and providing a model prospect on value-adding organizational transactions and activities (Bhimani and Pigott 1992; Chung et al. 1997). Booth and Giacobbe (1997), who studied activity-based costing in Australian manufacturing firms, found that the major benefits that adopters of ABC received from the implementation of ABC were more precise profit analyses, more accurate costing, better allocation of overhead, improved cost control and cost management. Moreover, several survey results (Innes and Mitchell 1991; Cooper et al. 1992a, 1992b; Swenson 1995; Chung et al. 1997) show that ABC information is utilized to support the manager's operating decisions, such as performance measurement, product design and process improvement. It is also used to

advocate for strategic decisions, such as customer profitability and pricing and product mix. Due to the increasing accuracy of output costs, ABC information enables managers to make better decisions on product, product design, process improvement, market segments and customer mix (Cooper and Kaplan 1988; Cooper et al. 1992b; Kaplan 1992).

According to Innes and Mitchell (1991), Shim and Stagliano (1997), Booth and Giacobbe (1997) and Chung et al. (1997), ABC is a significant source of information for decision making about product costs and product-line profitability. Kaplan (1990a) and Johnson and Kaplan (1991) also claim that accurate product costs are critical to pricing decisions, new product introductions, decisions to drop out-of-date products and decisions on how to respond to the products of competitors correctly and on time since product costs identify causes of resource consumption and ways of saving resources, especially at the product and process design stage (Morrow 1992). It can lead product designers to decisions on trade-offs between minimizing cost and desired performance (Kaplan 1992) and it provides the cost information of diverse designs that product designers can compare (Kaplan 1990a). Moreover, using product costing techniques at the design stage can be combined with target costing since product costs can determine the mix of products to manufacture and to sell (Atkinson et al. 1995) and can evaluate profitability by product group or customer type (Morrow 1992). In addition, Morrow (1992) indicates that ABC information is an exemplary method of understanding the collection of costs at each cost layer because it provides a meaningful combination between each customer and market segment and the resources they consume. Building cost layers of the ABC system increases revenue values

to create profitability analysis. The results of profitability analysis support management for future decisions on customer and market and for prediction of the likely cost of alteration in each market segment (Morrow 1992). Thus, Kaplan (1992) claims that ABC information can help to determine the segments and customers that can be satisfied profitably. In addition, Bukovinsky et al. (2000), who studied a U.S. distributor for industrial robots manufactured by a major Japanese company, found that ABC established the advantages in the sales and administrative areas because the ABC system considered all costs, as opposed to only costs of the products. It helps to increase the monthly operating income of the product line. Kaplan (1990a), O'Guin (1991) and Innes and Mitchell (1995b, 1998) also claim that ABC information is useful for managers in budgeting and performance measurement as activity-based budgets prepare objectives for each activity (Oliver 1994) and assess future resource needs (Innes and Mitchell 1995a; Turney 1996). Moreover, activity based budgets provide the links between the activities, the organizational acts and the resources consumed, and illustrate the differences between resource consumption and resource provision (Morrow 1992). As a result, activity-based budgets improve operational control and performance measurement (Morrow 1992).

Several studies (Innes and Mitchell 1991, 1993, 1995b; Bailey 1991; Nicholls 1992; Adler et al. 2000) report that the key areas of ABC benefits are cost control and cost reduction, as well as improved profitability. Turney (1996) states that in cost-reduction analysis, ABC does not decrease cost, but that cost can only be diminished by changing the activities performed and by redeploying the redundant resources, such as reducing the time to set up

a machine or removing unnecessary activities. Cost analysis of ABC leads to operational improvement opportunities and increased profitability (Kaplan 1992). O'Guin (1991), Krumwiede and Roth (1997), Moghaddam (1997), Innes and Mitchell (1998) and Redman (1998) state that ABC is a system that gets rid of the distortions of information in the traditional cost system and non-value-added activities, which do not add to the customer's satisfaction with the product. Seeing that it identifies the activities occurring and the resources they consume, and links the activities to processes as 'cost objects', an ABC system assists management to understand and to analyse business processes and their effects on the cost base. ABC's providing accurate cost information at the business process level, which is at the same level that total quality management (TQM) operates, also supports TQM to evaluate costs and to manage poor quality (Letza and Gadd 1994). Accordingly, Norris (1997, p.189) claims that 'ABC complements TQM'.

The analysis of the business processes by using activity analysis guides management to process improvement, including elimination of non-value-added activities (Morrow 1992; Roberts and Silvester 1996), and then the process improvement leads to cost reductions, one of the most important benefits of ABC (Adler et al. 2000) and one of the major subjects of TQM (Letza and Gadd 1994). Thus, Krumwiede and Roth (1997) claim that if ABC is designed to facilitate the other strategic initiatives, such as TQM, ISO and so on, it will support their implementation more effectively. As continuing process improvement is the successive identification and elimination of waste in operating activities, it helps to eliminate non-value-added activities, decrease time to perform activity, select the low-cost

activity and share activities with other products to yield economies of high-volume production. These ways of process improvement further reduce costs (Turney 1991). Hence, O'Guin (1991) claims that ABC can reduce costs of companies and increase quality contemporaneously.

In the more competitive environment of a turbulent economy, the importance of superior cost control, of coherent performance measurement and of precise knowledge of product costs increases because cost advantage is the essential component of differentiation strategies in competition (Johnson and Kaplan 1991). O'Guin (1991) also claims that the ABC system is a cost planning system that provides information for managers to plan not only differentiation strategies, but also low-cost strategies since ABC determines core activities and helps analyze systems and policies that drive costs. Kaplan (1992) claims that the ABC system provides valuable economic information to support a company's operational improvement and customer satisfaction programs. To survive and prosper in the competitive environment, managers need to use both ABC information and other information on revenues, customer preference, process quality and cycle times. Nonetheless, the benefits claimed are not always achieved (Player and Keys 1995) because Chenhall and Langfield-Smith's (1998b) survey results show that benefits which the companies gained from activity-based costing have a lower rank than benefits from other management accounting techniques. But, Bailey (1991) and Innes and Mitchell (1998) maintain that ABC benefits are far more valuable than its disadvantages. It was expected in

this study that Thai firms had an appreciation of the value of ABC and implemented it for development of themselves in the changed environment.

2.8 Implementation of ABC

3.8.1 A Model for Implementation

There are six steps in the implementation of ABC. The model presented below is adapted from Compton, 1996.

1. Forming the team: A multidisciplinary team must be assembled to design the ABC system to reflect correctly the workings of the company. This team should be selected and assigned to the project full time. It should be composed of three to five people, and should include representatives from manufacturing, marketing, management information systems (MIS) and accounting. All team members must be open-minded, knowledgeable about the company's operations, and well respected. The benefits of the team approach include smoother implementation and greater design effectiveness. Members from across the organization also ensure a broader acceptance due to better communication, transfer of knowledge, and awareness of the benefits.
2. Deciding on Design Choices: At least six major decisions should be made before an ABC system can be implemented. These are as follows:

- Should the system be integrated with the existing system or should it be a standalone system?
- Should a formal design be approved before implementation?
- Who should take the "ownership" of the final system?
- How precise should the system be?
- Should the system report historical or future costs?
- Should the initial design be complex or simple?

3. Training: Training is essential for effective implementation, execution, use, and acceptance of an ABC system. Training is an ongoing process throughout the life of the project. Three groups should be addressed in designing a training program.

- Management: Management must have enough knowledge about ABC and its potential benefits.
- Implementers: The implementation team must have enough knowledge about technical design needs, software-modeling capabilities, and project organization.
- Users: Users should understand the benefits of the ABC information system and how this information can be used in decision-making.

4. Gathering Information: A vital component of the ABC implementation is identifying the information requirements of its users. Each phase of information gathering should include a member of the implementation team and the user. The requirements of the system and the information needed should be explored. Questions each user should attempt to answer include the following: What key

decisions must I make, and how often do they arise? What other cost information would be useful in carrying out my responsibilities? Documentation and note taking of reviews of records, observations, interviews, questionnaires, and interfaces with the existing information systems are some of the techniques that can be used in this step.

5. Creating an ABC Systems Model: This is the most important step in the design of an ABC information system. Each model has a set of resources, resource drivers, activity centers, activities, cost drivers, cost elements, and cost objectives. Flowcharting is recommended to gain a better understanding of the complexities of cost allocation. As a starting point, the organization chart can be used in the model. The process of converting the organization chart to an ABC flowchart by breaking down tasks into divisions, resource centers, and activity centers is called functional decomposition. Activity centers should be established in this step. To do this, all activities related to accomplishing a particular attribute should be grouped. These clusters of activities form the activity centers. Clustering activities will reduce the level of detail substantially, but it will also decrease the amount of effort required. A good rule of thumb is not to have more than 20-25 activity centers for an ABC project. Analyzing and identifying the resource and cost drivers is a crucial step in building a model for an ABC project. A general rule to follow in selecting resource and cost drivers is to pick drivers that will show a cause-and-effect relationship. After resource and cost drivers are determined, resources are allocated to the

activity centers. Finally activities in activity centers are allocated to the products depending on the types of activities. Computer technology should be utilized especially in this step. A computer model will provide an easy mechanism for manipulating the model and performing a sensitivity analysis.

6. Post-implementation Review: Like any other system initiatives, the ABC system must undergo a post-implementation period. Hidden problems must be uncovered and solved, system components must be fine-tuned, and users must learn how to operate the system. To assure that the desired results are achieved, members of the ABC implementation team should be assigned as troubleshooters. They can observe operations and assist in making any adjustments. Any necessary changes should be carefully controlled. The post-implementation evaluation enables the ABC project implementation team an opportunity to assess the degree to which the ABC project objectives have been met, to determine the necessary modifications, to evaluate the implementation team's performance, and to make recommendations about the improvements of the system in the future.

3.8.2 Vital Factors in ABC Implementation

There are many factors that affect the success of ABC implementations. Based on an extensive search of the literature, the most important eight factors are as follows: top management support, other major initiatives, linkage to performance evaluation and

compensation, training, non-accounting ownership, resources, and information technology sophistication.

3.8.2.1 Top Management Support

Research shows that top management support is the most crucial factor in the success of ABC implementation. This finding is, in fact, consistent with the more general finding that almost all successful innovations require the support of top management. Top management should focus resources, goals, and strategies on the implementation of ABC. They must demonstrate a commitment to ABC by using it as the basis for decision making. To encourage the use of ABC information, top management must use ABC information in communications and agreements with other employees.

3.8.2.2 Other Major Initiatives

According to a recent survey conducted by the Cost Management Group of the Institute of Management Accountants (IMA), 62% of the firms trying to implement ABC but not having reached the usage stage report other major initiatives being implemented currently. Several companies expressed that they cannot commit enough resources to the implementation of ABC because of their need to implement other initiatives such as Total Quality Management (TQM), lean manufacturing, Just-in-Time (JIT), and balanced scorecard.

3.8.2.3 Linkage to performance evaluation and compensation

Shields and McEwen articulate that the importance of the linkage between performance evaluation and compensation, and ABC implementation is natural because employees pay attention to those things that affect their welfare. The welfare of most employees is affected by the system used to evaluate and compensate them. Therefore, when ABC is linked to performance measurement and compensation, and when employees believe that the resulting system fairly represents their performance, they will be motivated to help ABC succeed.

3.8.2.4 Training

Training is important to help people understand how ABC differs from traditional cost accounting and why ABC provides a superior economic measurement and information system. It also increases non-accounting ownership. ABC requires training from the senior management to the shop floor. Training can include readings, lectures, hand-on projects, and on-the-job training.

3.8.2.5 Non-accounting ownership

When ABC is owned only by accountants, there is a danger that it might be used only to satisfy their needs. An important reason why some companies have not had good implementation experiences is that the accountants have retained ownership and have not

succeeded in sharing ownership with non-accountants. For this reason, not only accountants but also non-accountants should be seen as the owners of the new system.

Non-accountants should be involved in the initial decisions to invest in ABC, and in the design and implementation of ABC. In this way the chances that non-accountants will support and promote ABC, and be committed to its use and success will increase.

3.8.2.6 Resources

The process of designing and implementing an ABC system requires companies to have adequate resources. The necessary resources primarily include the time and commitment of accountants, top management, operating employees, software, and external consultants. The implementation of ABC often takes more time than expected. The companies who have participated in the survey of IMA report an average of 3 years for implementation before they can start to use ABC. The amount of time necessary to reach the usage stage varies with the size of the company. In a survey of 143 companies, Shields and McEwen found that having adequate employee resources is one of the most important factors for ABC success. Interestingly, however, the other types of resources, such as commercial or custom-made software and also external consultants, did not prove to be important to the success of ABC implementation. Most companies surveyed use commercial software to help structure their ABC design and to process ABC information. The availability and use of commercial software versus custom software did not prove important to the success of ABC in the long run. Shields and McEwen argued in their study that the choice of software

as a technical information system is important for accountants and Management Information System (MIS) specialists, but this choice is relatively unimportant to non-accountants or for the ultimate success of an ABC project.

3.8.2.7 Information Technology Sophistication

In the survey conducted by IMA, a high level of information technology (IT) sophistication appears to be an important factor in getting to the usage stage for the majority of the companies. Sixty-one percent of the usage-stage companies received an above average IT score, compared to only forty-six percent of the non-usage stage firms. ABC implementation will be much easier if the IT of the company has the following characteristics: good subsystem integration; user-friendly query capability; available sales, cost, and performance data going back 12 months; and updates of all these types of data.

2.9 Activity-Based Management (ABM)

Activity-based management is defined by CAM-I as "a discipline that focuses on the management of activities as the route to improving the value received by the customer and the profit achieved by providing this value". The terms "ABC" and "ABM" should not be used interchangeably. ABC is only a tool for determining the costs of activities and the outputs that those activities produce. ABC, by itself, is not enough for continuous improvement of the company. On the other hand, ABM is a management philosophy that focuses on the planning, execution and measurement of activities and helps companies to survive in the competitive world of business. ABM uses the information obtained through

ABC to reduce or eliminate non-value added activities, and as a result, improve the overall process. Cooper et al. explain this important difference as follows:

ABC information, by itself, does not invoke actions and decisions leading to improved profits and operating performance. Management must institute a conscious process of organizational change and implementation if the organization is to receive benefits from the improved insights resulting from an ABC analysis.

ABC information indicates the activities having the highest opportunity for cost reduction. After identifying the target activity, management should determine whether the high cost of this activity is a problem of efficiency or of effectiveness, or whether there is a problem at all. In order to reduce cost, effectiveness should always be emphasized over efficiency. If a job is a non-value added activity, it should not be performed at all rather than being performed more efficiently. The management should first consider the necessity of performing an activity. Only after the management decides that the activity cannot be eliminated, should improving its efficiency be taken into account. In order to determine whether a company or a customer requirement is causing the activity's frequency, O'Guin suggests investigating the trigger of the activity. If the high frequency is caused by the company, the management should either try to eliminate it or to reduce its frequency by increasing its efficiency. If the high frequency is caused by the customer, the management should try to come to an agreement with the customer limiting the activity. Flowcharting can be used in identifying the non-value added activities in a process. Management should always use the information obtained by ABC with caution because using this information

inappropriately can lead to sub-optimization of the system. The management should not try to optimize each component of the system, since optimizing each component probably means sub-optimizing the system. Reducing costs in one process can increase costs in another process. Also, management should not reduce cost at the expense of flexibility and customer satisfaction. This is an area where ABM is criticized because managers using the information obtained by ABC tend to improve processes without considering the negative effects of these improvements on flexibility and customer satisfaction. A new method in the process improvement aspect of ABM has been introduced by Cooper and Kaplan. In their article "Activity-Based Systems: Measuring the Costs of Resource Usage", they suggest not allocating the unused capacity costs to the products. The unused capacity costs should be isolated and not included in the product costs. In this approach, the unit cost of a product does not change as the number of units produced increases, however this change decreases the unused capacity cost associated with each activity used in the production of the specific product. ABM and (Theory of Constrains) TOC together can help to model the company so that the bottlenecks and the cost of unused capacity will be revealed. Management can use this model in deciding which activities to focus on for improvement. This new approach to capacity management will be explained later in detail. (Holmen, 1995)

2.10 ABC Criticisms

ABC proponents argue that the system produces accurate product cost data for decision making. Daour states in his PhD thesis that there is a trade-off between the benefits

obtained from increasing cost drivers and costs associated with cost drivers. Increasing the number of cost drivers gives more discretion to the managers who are being evaluated by the cost system so reducing the ability of the system to monitor their behavior. Adding the costs incurred from loss of control arising from managers' discretion in choosing the cost driver to the direct costs of collecting and reporting data on the activity levels will make the net benefits lower and the optimum number of the cost drivers for both decision making and control will be less than for decision making only. So fewer cost drivers and less accurate product costs may be desirable. From another point of view more accurate product costs are undesirable if it leads to poorer decision control. For example, some firms prefer to bias their costs upward to prevent the sales force from shaving margins by setting prices so low that they cover only variable costs.

The major problem experienced by the system is related to the lack of adequate internal resources, particularly staff time and computer resources. 21 factors that influenced ABC implementation at General Motors. These factors include the individuals involved, the organization structure, the task, the technology employed and the external environment and all of these factors made it more difficult to "properly" implement ABC. Another criticism of ABC arises from its decision-making relevance.

When it comes to practical deficiencies ABC seems to have a number of shortcomings. It has been suggested that it should be possible for an organization to trace all overheads, but in practice it is quite likely that there will be some overheads that cannot be traced.

ABC uses multiple cost drivers because it assumes only activities cause costs. However, decisions, time, and volume also cause costs. These factors, together with lagged relations

between resource consumption and cash spending, mean that ABC is not a perfect cost control or prediction model. it is not inevitable that more refined costing systems such as ABC will always lead to more accurate product costs in all circumstances.

C H A P T E R 3

DECISION MAKING LITERATURE

3.1 Introduction

Our lives are full of decisions: what to wear; what to eat for breakfast; whether to eat breakfast at all; which way to go to work. And when we reach work the decisions really start to pile in. Worse still, those organizational decisions can affect the lives and livelihoods of hundreds of people and large sums of money, not to mention the very existence of the organization in which we work.

No wonder many people are of the conviction that decision-making is the core task or activity of the manager. Chester Barnard included it as one of the four key elements of formal organisations in The Functions of the Executive (1938). Mintzberg (1989) felt it was possibly the most important activity, representing the most common and crucial managerial task. Peter Drucker was similarly persuaded.

Henry Simon concurred, arguing:

‘*The executive’s job involves not only making decisions himself, but also seeing that the organization, or part of an organization, that he directs makes decisions effectively. The vast bulk of the decision-making activity for*

which he is responsible is not his personal activity, but the activity of his subordinates (1960: 4-5).

This highlights an important aspect about managerial decision-making: the additional responsibility of managers to ensure their staff make, and continue to make, effective decisions. In today's more decentralized and flatter work-places one is tempted to argue that this responsibility is greatly reduced. Now organizational decision-making appears the responsibility of the individual worker as educated, empowered, autonomous professional. But as Simon (1960:43) says later: 'The question is not whether we shall decentralize, but how far we shall decentralize', for at the end of the day the authority and responsibility for all the decisions made in an organization rests upon the shoulders of the managers, if not the CEO alone. The same is true when it comes to group and team decisions where one is tempted to avoid personal responsibility amongst the herd.

Furthermore, it is not just a responsibility to ensure the most effective decision is made, but that the decision is also correct in the ethical sense. Decision-making goes beyond simply considering what is desirable and/or what is feasible and into the realms of what is best in a utilitarian sense, what is correct according to the rules, what is correct according to peoples' rights and what is correct according to the imperative of justice.

No wonder someone once said the most important decision they ever make every day is whether to get out of bed or just roll over and go back to sleep. Such people do not

make efficient or effective managers, although we all probably know managers who appear to fit that description.

Three definitions do show that a decision:

- is an action: a conscious choosing or consideration of possible options;
- is linked to perception: ones perceptual set or 'reality'; and
- is a product or outcome of that action which relates to something occurring in, or affecting, the future.

3.2 The Decision-Making Process

Is that action aspect a simple act of choosing between possible options as the 'decision' definitions of Robbins and Boulding appear to suggest?

- 'Decision making refers to the process of making choices from among several options' (Hucyznski & Buchanan 2001:738);
- 'A conscious process of making choices among one or more alternatives with the intention of moving towards some desired state of affairs' (McShane & Travaglione 2003:296);
- 'Decision making is the process of identifying a problem or opportunity and choosing among alternative courses of action' (Wood et al 2004:548);
- 'Identifying and choosing solutions that lead to a desired end result' (Kreitner & Kinicki 1995: 299); and

- ‘The process through which managers identify organizational problems and attempt to resolve them’ (Bartol et al 1995:256).

From these basic definitions several stages appear to be present in the basic process:

i) Identification of a problem. Woods et al broaden this by including ‘opportunity’. In decision and decision-making theory it is better to think not so much of the catalyst being a problem, but a situation. But generally texts talk about problems. What is important here is to differentiate between types of problem or situation. Check out some texts. What you will probably find are different typologies of problems/situations. Bartol et al, for instance, differentiate between crisis, non-crisis and opportunity problems.

ii) Identification of a goal, that ‘desired state of affairs’;

iii) Identification of solutions ie options or methods as to how to achieve that goal ; and

iv) Choosing one of the solutions to achieve the desired goal. Note how this appears fourth whereas several definitions allude to this stage as the full process.

McShane and Travaglione (2003:296) present a six stage general model of decision-making. Patterson (1969:150) delineates five stages between the Situation and the Action in his model of the organisation decision-making process:

- Information input – what can be done;
- Interpretation and advice – what should be done;

- Choice – what is intended to be done;
- Authorization – what is authorized to be done; and
- Execution – what is actually done?

3.3 The Classical Model of Decision-Making

In essence, what has occurred so far in this section about the decision-making process is the attempt to create a simple general model of the organizational decision-making process that rests upon the traditional approach to decision-making. This approach is founded upon classical decision theory and the rational economic model. You will, therefore, often find such models referred to as the Classical Model of Decision-Making, and sometimes as the Rational Model or the Rational Choice Model. Before considering the assumptions upon which classical decision theory and the rational economic model rest, consider a Classical Model of Decision-Making that has nine stages as found in Vecchio, Hearn and Southey (1992:417) and which appears to cover the whole range of the process:

- opportunity or problem situation;
- opportunity or problem recognition;
- opportunity or problem definition;
- generation of options;
- gather information;
- evaluate options;
- selection of one option;

- implement selected option; and

- evaluate effectiveness of implemented option which feeds back to the opportunity or problem recognition stage.

So, upon what assumptions does this type of model rest? You can find your own sources for these but essentially:

a) classical decision theory assumes all decision-makers:

- are objective;

- have clear preferences which are constant over time;

- have complete information available at no cost; and

- consider all possible options and the consequences of these before selecting the optimal solution.

b) the rational economic model assumes that decision-making is and should be a rational process consisting of sequential steps enhancing the probability of attaining the desired outcome which yields the highest perceived value or utility.

This traditional approach and the models it generates rest squarely upon the concept of rationality ie scientific reasoning, empiricism, positivism, evidence and logical argument and reasoning.

3.4 Prescriptive Models of Decision-Making

Given all the shortcomings of the classical or rational model of the decision-making process it is now generally accepted that it represents at best how decisions should be made to achieve a desired outcome. Just because something is an ideal doesn't mean that we give up trying to achieve as close to that ideal as we can. And we have to take into consideration the social and ethical aspects too. To this extent the model can be considered the basic prescriptive model. Prescriptive decision models fundamentally contain specific techniques, procedures and processes which are believed to help create more accurate, efficient and effective decision-making. As Hucyznski & Buchanan (2001:741) note, in many instances they are 'based on observations of poor decision-making processes, where key steps might have been omitted or inadequately considered'. Generally they feature a list of steps, a logical framework and, of course, emphasize rationality. Examples include critical path analysis and decision trees.

The latter are so called because they contain a series of choices which branch out along Yes or No lines leading to various end points. These were developed for an organisational context by Vroom and Yetton (1973) who identified five distinct decision-making styles, the choice of which to apply being dependent upon the type of problem situation. This was expanded by Vroom and Jago (1988) into four decision trees representing generic types of problem frequently encountered by managers, viz individual and group level problems

facing time constraints, and situations where the manager wishes to enhance individual and group level decision-making abilities.

The problem with prescriptive models is that they deal purely with how decisions should be made. To this extent they can be regarded as somewhat ideal and unrealistic, almost utopian.

3.5 Descriptive Models of Decision-Making

In an attempt to retrieve some semblance of reality descriptive models began to be developed. These focus on how decisions are actually made, recognising that decisions are affected by the interrelationship of several factors in varying degrees of importance over time including: personality; group relations; organisational power relationships and political behaviour; organisational strategic considerations; external environmental pressures; and the availability or lack of information. Now we seem to be coming more in touch with reality. Instead of legal-rational authority running the game we have power networks and shifting political alliances, people withholding resources and information for their own purposes, bare-faced competition rather than smiling co-operation, stupidity and ignorance rather than knowledge and fact, fear and trembling rather than security and confidence. And, most of all, time management constraints.

One of the first of these normative based models is the behavioural theory of decision-making developed by Simon (1960) and expanded by Cyert & March (1963) and March (1988). It is often called the administrative model and recognises that decision-makers operate within the limits of bounded rationality. This refers to individuals making decisions by constructing simplified models that extract essential features from problems whilst omitting elements of complexity. We are thus restricted in our decision-making processes and are forced to settle for a less than ideal solution, a solution that is merely good enough, one that meets the minimum requirements but which may not be optimal. We do not maximise – contemporaneously review the range of options available and attempt to select the best one – but satisfice – seek the first solution that is both satisfactory and sufficient. No wonder we have crisis-management and why problems 'solvered' come back and bite us in the fundament when we least expect it.

3.6 Explanatory Models of Decision-Making

Prescriptive and most descriptive models appear to progress forward, from problem or situation to decision and action. But there is another group of models that appear to move backwards. These look at what decisions were made and attempt to provide an explanation of how they occurred. Such models are known as explanatory models. These are based on heuristics, which are judgment shortcuts or rules of thumb that we use to reduce information-processing demands and speed up decision-making. After all, making the right decision late is often considered synonymous with making the wrong decision.

These models represent a further step away from the classical model and the rational mode of thinking. They were developed mainly by the decision theorists Tversky and Kahneman and the social psychologist Cialdini. Their work suggests that heuristic-based decision-making exposes users to biases inherent in human intuition and operating almost unnoticed at the subconscious level. These biases, however, have a powerful and immediate impact on individuals' judgments. The three most common biases are considered to the representative heuristic, the anchor-and-adjustment heuristic and the availability heuristic.

The first of these uses the similarity of one object to another to infer that the first object acts like the second. This causes people to ignore other relevant information. For example, how often do you use price or packaging to infer the quality of a product or service? Many managers frequently predict the performance of a new product purely by relating it to a previous product's success or failure without fully considering why the previous worked or failed nor without fully considering the differences between the two. This possibly goes someway to explain the decisions to make all those failed Hollywood sequels. And why, when a friend's original Reeboks made in the UK lasted a couple of years, he happily bought a pair made elsewhere for almost the same price without carefully checking them over only to find they lasted a mere two months before falling apart.

The anchor-and-adjustment heuristic, put simply, suggests that starting from somewhere is easier than starting from nowhere and different starting points yield different answers.

When we place a value on something the initial value, or anchor, is derived from past events and we typically fail to make sufficient adjustments, up or down, to reflect other factors when we establish a final figure. Why do you think employers ask job applicants their current salaries? As Slovic & Lichtenstein (1971) advise, if asked what your fee is, select a high figure.

The availability heuristic is used to estimate the probability of an event by assessing how readily instances of it come to mind. Vivid, emotional, specific and easily imagined events are more available in our memory than ones that are bland, emotionless, vague and difficult to imagine.

Whilst on the topic of biases consider others that affect and explain decision-making. Two others, for example, are framing – the tendency to make different decisions depending on how a problem is presented – and overconfidence – the tendency to be more certain of judgments regarding an event's likelihood than is justified although, perversely, this often occurs when dealing with unfamiliar areas and potential pitfalls fail to be understood. Various texts list many others.

However, if you think about these biases you will quickly begin to see links between them and the distortions of perception considered in Topic 3. For example, consider the similarity between the availability heuristic and the recency and primacy effects. How about a similarity between stereotyping or halo/horn effect and the representative heuristic? What is this telling us about the decision-making process?

3.7 Summarising Decision-Making Process Models

What do these various models tell us about the decision-making process? The classical model suggests that decision-making should be based on the dictates of rationality and the rational mode of thinking. To a certain extent this appears correct. After all, organisations are expected to be based on legal-rational authority in both structure and dynamics. Other prescriptive models build on this rational model attempting to show how decision-making can be improved by increasing the degree of rationality contained within it. Descriptive models, on the other hand, accept that rationality in decision-making is, in varying degrees, unrealistic when human beings begin to get involved in organisations' social and capitalistic interactions. The non-rational aspects of human beings and their environment begin to affect decision-making and the models base themselves more on a critical theory understanding of power rather than authority, an acceptance of contingent variables rather than the one best way. Explanatory models appear to disregard rationality altogether and argue that the decision-making process is based more on biases and judgmental shortcuts, perceptual set distortions and rules of thumb – in other words, personally perceived rationality.

So, is there, or can there ever be, a truly realistic model of the decision-making process? Don't wish to be flippant or accused of passing the buck, but, hey, you decide. And whilst you are deciding, consider which model(s) you are using, and why.

Furthermore, having decided, what type of decision have you just made? To answer that, consideration is now given to the output or product meaning of the word decision.

3.8 Types Of Decisions

There are several different ways of classifying decisions and this section will briefly give three of them. However, there are other typologies and classifications in the literature which you may find useful so do not think this section has the only answer.

Probably the most fundamental classification is to consider where the focus of the decision lies: ie personal; or organizational. Personal decisions focus on our own actions and lives rather than those of others. Those introductory examples – what to wear, whether to eat breakfast – are all personal decisions because they concern only ourselves. Many personal decisions are trivial like these; in fact, we would not even consider some of them as decisions. Others, such as which university to attend or which career to follow, are not so trivial because they have lasting and major effects on our lives. Organizational decisions focus on problems and practices of a given organization. Again, some may be trivial whilst others, such as a new advertising campaign or development of a whole new product, can be major in that they can make or break an organization. To a certain degree it is these organisational decisions, rather than personal ones, in which managers are involved in their workplaces.

Another classification is based on regularity ie whether the decisions were routine and well-structured or unique and unstructured. The first of these are called programmed decisions, the second non-programmed. These should be considered more as extremes as most decisions fall into a mainly programmed or mainly non-programmed category. Programmed decisions take little time to make because they have arisen before and there is

a precedent to follow. Non-programmed decisions require longer time and often new ways of thinking - they are thus sometimes termed innovative or adaptive decisions.

These two classifications can be combined, as both personal and organisational decisions can be either programmed or non-programmed, into four distinct classes:

- Personal programmed: simple repetitive personal matters such as daily routines and habits;
- Personal non-programmed: those rare but significant major decisions such as job selection, whether to propose or accept a proposal of marriage;
- Organizational programmed: these follow established guidelines, rules and operating procedures and are generally the domain of lower level personnel; and
- Organizational non-programmed: those major planning issues and problems such as a change of strategic direction, crisis management and whether to launch a take-over bid. These are the domain of senior managers and executives, and afford great opportunities for creativity.

A third classification of decision types is based upon who decides ie whether the decision is made by an individual or by groups. In organizational terms it should be remembered that most decision-making contains elements of both of these, and given their separate and combined importance for management individual versus group decision-making will be considered in its own section that follows.

However, before doing so let us return to the question lodged at the end of the previous section – what type of decision you made concerning the models of decision-making. Quite clearly it was personal, as it only affects you, and more than likely it was an individual

decision in that you decided it for yourself. But was it programmed or non-programmed? If this is the first time you have applied various models of decision-making to yourself it was a non-programmed decision in that it was new to you, requiring a new awareness of what you were actually doing and a new way of thinking. However, a few of you may already be aware of how you make decisions and followed a system you have tried and tested before, possibly using a heuristic. In this case, the decision was of an individual personal programmed type. More than likely therefore you missed to the chance to practice moving from routine producer to knowledge worker.

3.9 Individual Versus Group Decision-Making

As the earlier discussion on heuristics highlighted, there is a danger here of individual biases affecting the decision and, as the critique of the classical model indicates, individual human beings are often unable to cover all possibilities or have the ability and capability to generate and work through all the information, calculations and nuances thrown up and required by situations, especially those requiring a non-programmed decision. For these and other reasons, the old adage ‘two heads are better than one’ seems to suggest that group-made decisions will be better than those made individually. (Kreitner R & Kinicki A, 1995)

Much research tends to bear this out with group decision-making performance being seen to be in general qualitatively superior to that of individuals. Groups, if created and run properly, contain a greater pool of knowledge and provide varied perspectives that will aid the generation of more options. They allow a wider comprehension of both problems and

decisions, providing a training ground for the less experienced and a stronger legitimacy to, and wider acceptance of, the decisions made. A greater division of labor can also be achieved with individual members focusing on different areas of the problem at the same time. This can help individuals avoid being swamped or intimidated by the scope and depth of the problem, of having to cover all the various aspects on their own. Participation also brings greater social and affiliation rewards to the members than that which individuals working alone tend to reap.

However, group decision-making contains disadvantages. Research indicates that, quantitatively, groups perform less satisfactorily than individuals. It tends to be more costly, taking time to assemble a group and with member interaction frequently being inefficient – think of the social chit-chat and members turning up late. Generally groups take more time to reach a solution than individuals. Given this time and energy consumption group decision-making is best reserved for making those important non-programmed decisions requiring high quality solutions. Members may not participate fully, causing the process to stall further. If some members hold a vested interest in the problem or the outcome they may attempt to dominate proceedings, enter into political wheeling and dealing, and even withhold information or their own known solutions. Sometimes goal displacement occurs where secondary considerations such as winning an argument, making a point or 'fixing' a rival takes precedence over the primary task of making a sound decision or solving the problem. Group members are notorious for not accepting joint responsibility for a poor decision or claiming sole responsibility for a good one. And in an individualistic competitive system such as capitalism some individuals are just not

interested in playing the collective cooperation game, whilst others are intimidated by working with others, fearful of speaking up in case they sound foolish. Some individuals just work better on their own. Decision quality is also negatively related to group size. When there are serious environmental threats, such as time pressure or a potential serious impact of a decision, groups tend to use less information and fewer communication channels, increasing the probability of a bad decision – thus the importance on complex problems to create methods that enhance communication effectiveness. (McShane S & Travaglione T, 2003)

There are also three other very serious problems to group decision-making: group polarization; groupthink; and escalation of commitment, the latter of which also pertains to individual decision-making.

Research has found that groups tend towards riskier decisions than what their individual members would take in isolation. One possible reason for this is the diffusion of responsibility in a group setting - when in groups individuals feel less personal responsibility for the consequences of their actions. However, occasions have also been found where groups tend to make more cautious and conservative decisions than their individual members would. This tendency of groups to shift towards these two extremes is termed group polarization and it has been found that groups tend to endorse dominant cultural values. So, in business and career-related decisions where the dominant cultural value favors risk-taking, groups are more prone to favor riskier decisions than individuals deciding for themselves. (McShane S & Travaglione T, 2003)

Groupthink is the tendency of groups to seek agreement at the expense of realistic situation appraisal. When it occurs, preservation of the group's harmony and cohesiveness become more important than providing further solutions, conflicting information or different perspectives. Recent research suggests groupthink can occur in groups that are not highly cohesive. Groupthink can be utterly disastrous, as in the Challenger space shuttle tragedy. Eight main symptoms or signs of groupthink have been identified: an illusion of invulnerability; rationalization; assumption of morality; pressure to conform; negative stereotyping of non-conforming members and non-group people and their information; self-censorship; illusion of unanimity; and 'mindguards'. (McShane S & Travaglione T, 2003)

Ever heard the sayings 'fighting a lost cause', dying in a ditch', or 'throwing good money after bad'? These are all symptomatic of a problem termed escalation of commitment where individuals or groups become unwilling to change a course of action despite unequivocal evidence showing that the original decision was incorrect or dubious. Instead of rectifying the bad decision they persist with it because of the substantial time, effort, interest and/or money they have already invested in, or committed to, the existing situation. This frequently occurs when decision-makers feel a strong sense of responsibility or involvement. Again, this tendency can be disastrous for an organization. (Robbins SP, 2003,)

3.10 Enhancing Decision-Making

An understanding and awareness of the various models of the decision-making process can help enhance decision-making, allowing it to become more rational and objective, making us more aware of perceptual bias and contingent variables. But there are others including:

- a greater willingness to choose;
- being able to modify or compromise on an unobtainable ideal, such as switching ones goal from what is desirable to what is feasible;
- the crucial ability to think from cause to effect and identifying likely consequences of all options;
- being able to process information efficiently and logically;
- assessing and critiquing the credibility of both information and its sources;
- altering the decision context rather than the decision-maker;
- consistency in decision-making; and
- following up on decisions once they are implemented. (Vecchio RP, Hearn G, Southey G, 1992)

3.11 ABC And Decision Making

Activity-based costing (ABC) won't improve a company's financial reporting. It probably won't save money on taxes, either. It will, however, facilitate decision making in operations. To sell a company and staff on ABC, the focus must be on convincing operating managers of the benefits to them from the "new" information ABC will provide (Lere, 2002).

3.11.1 ABC as Cost Behavior

For cost data to facilitate decision making, the costs must be linked to levers that managers can adjust. Cost data needs to reflect how alternatives affect the level of various costs. ABC is frequently presented as product costing or cost allocation. If ABC is to facilitate decision making, it should also be presented in terms of cost behavior.

Cost behavior traditionally classifies costs as either variable—that is, varying in direct proportion with some measure of volume such as units produced, direct labor hours worked, machine hours worked, or dollar sales—or "fixed"—that is, everything else.

In the ABC literature, costs are classified as varying at the unit, batch, or product level. Costs that don't vary at any of these levels are facility-level costs. The activity that causes a cost to change, or the measure with which it varies, is called its cost driver.

Unit-level costs vary with unit volume and are very similar to traditional variable costs. An important insight from the ABC literature is that there are two other categories of costs that vary, though not with unit volume. Batch-level costs do not vary by number of units, but rather by how these units are grouped. For example, once a machine is set up for a production run, no additional costs are incurred until the machine needs to be reset. Product-level costs are incurred to benefit all units of a type. For example, once a product's design is complete, no additional costs are incurred, regardless of the volume of units or number of batches. Additional product design costs will only be incurred if the design is changed.

The recognition that costs also vary at the batch and product levels allows ABC to facilitate decision making. Traditionally, costs that vary at the batch and product levels would be considered fixed; therefore, estimates would not change when managers change the level of a cost driver. Ignoring changes at the batch and product levels, of course, means cost estimates provided to an operating manager may understate the cost of certain alternatives (Lere, 2002).

3.11.2 Operational Examples

Production managers. Among the operating decisions faced by production managers are plant layout decisions and production scheduling decisions.

One consideration in plant layout decisions is the flow of units through the plant. Moving units around the plant (e.g., by loading pallets onto a lift truck) results in batch-level activities and costs. The cost of moving a group has less to do with the number of units in the group than with the distance it is moved. ABC will provide cost estimates reflecting the differences in the cost of moving units around different plant layouts while estimates based on traditional cost behavior will not.

In production scheduling, the cost to set up machines can be significant. For example, setting up a printing press requires preparing a printing plate, attaching it to the press, and running proofs to assure the plate is properly positioned and inked. ABC, unlike traditional cost behavior, provides estimates so that appropriate trade-offs between competing production schedules can be made.

Product designers. Although many product design decisions involve trade-offs among unit-level costs (e.g., attaching a case to the unit using screws or tabs), others affect batch- and product-level activities and their associated costs.

For example, the choice between using a part common to other products or using a unique part involves product-level activities. Adding a new part to existing operations requires product-level activities such as adjusting stock space to accommodate the new part, modifying computer systems for a new SKU for the new part, and modifying stock pickers' routines.

The choice to use a unique part will also require additional ordering and receiving activities, which are usually batch-level activities. If a common part is used, quantities to be used in the new product can be ordered and received at the same time as quantities for existing products.

Supply managers. Batch- and product-level costs similar to those discussed under product design decisions are also important to supply managers as they select among alternative suppliers and delivery schedules. For example, purchasing a part from a new supplier, as opposed to an existing supplier, may require new stocking space, a new SKU, and new picking patterns for stock pickers. As discussed above, these activities all give rise to product-level costs. Adding a new supplier will also require changes in the accounting system to recognize the new supplier and arrange credit terms.

Selecting a new supplier will also increase the volume of ordering and receiving activities and their related batch-level costs not considered by traditional methods. The costs of receiving activities will also often be important in the choice among delivery schedules.

***Sales representatives*.** Sales representatives must often decide which of several customers to focus sales efforts on, which price adjustments to work toward with a customer, and even which customers to cease serving. Activities undertaken to service a customer are often at the batch or product level. As a result, a customer who appears profitable based on traditional cost behavior estimates may actually add nothing to, or even reduce, the company's bottom line.

A major portion of batch-level activities undertaken to service a customer relate to the number of delivery batches into which the customer divides an order. If each batch must be produced in a unique production run, manufacturing activities (such as machine setup) will be required to produce each batch. If, instead, the item is kept in stock, supply management activities (e.g., stock picking from the warehouse) must be performed for each batch.

If servicing a customer requires unique product modifications, designing and initiating those modifications requires product-level activities. Developing product tests to meet unique customer specifications is another product-level activity that may differ significantly from customer to customer.

Not only does ABC explicitly recognize that costs are associated with these activities, it also provides guidance as to how prices should be affected. For example, ABC can provide

an estimate of the cost of making multiple deliveries when prices are negotiated with a customer who requires this.

Marketing managers. Marketing managers must evaluate the performance of sales representatives for the purposes of compensation, bonuses, or perhaps termination. Because sales representatives often negotiate all terms of a sale, price and volume are not the only measures marketing managers may find relevant in evaluating sales performance. Many of the same costs that facilitate customer performance evaluation are also important to consider in evaluating sales representative performance.

For example, the sales representative may negotiate the number of locations to which an order is delivered or the amount of training provided to a customer's employees. As discussed above, traditional costing methods will yield performance evaluation measures that suggest that the cost to service a customer at one location is the same as servicing multiple locations. The cost of customer training is independent of both the number of units sold and the number of batches. Traditional cost behavior estimates will not be affected by different amounts of customer training agreed to by a sales representative. Because ABC recognizes that costs change at the product level, it accommodates cost-based performance measures that do reflect that there is a difference between a sales representative that has agreed to provide 200 hours of training and one that has agreed to 2,000 hours of training (Lere, 2002).

3.11.3 Winning over Decision Makers

Implementing an accounting transformation like ABC only makes sense if it improves the ability of the organization to function. The impetus for change must come from within the organization.

Within an organization, operating managers stand to benefit the most from ABC. If the costs of major activities involved in a manager's operations are at the batch or product level, then the cost estimates provided to these managers will often be significantly different, and more accurate, when developed under ABC.

To sell ABC to top management, it must first be sold to the operating managers, who will benefit the most. To sell it to them, one must understand the levers they can adjust and how those levers change costs (Lere, 2002).

Chapter 4

RESEARCH METHODOLOGY

4.1 Introduction

In this chapter, the research methodology utilized in the current study is described and the research Hypothesis relating to the objectives of the current study are stated.

Various methods available for collecting data and the characteristics of the sample group are also set out in this chapter. In order to preserve the rights and safety of the participants, rules on ethics and confidentiality in collecting data also are described. In addition, details of variables and the questionnaire design to test the Hypothesis, as well as testing questions in the questionnaire, are outlined. Finally, techniques to analyze data are provided.

4.2 Hypotheses

The first objective of the current study is to examine the applied costing systems and its role in decision making in Gaza Strip factories.

In the current study the researcher proposed that the Gaza factories lacks to financial and costing systems that can helps the management in taking the rational decisions. The first Hypothesis is stated as follows:

Hypothesis 1: The costing systems in the Gaza Strip factories do not provide competent tool for rational decision making.

The second objective of the current study is to examine the adoption of ABC by Gaza Strip factories.

In the current study the researcher proposed that the Gaza Strip factories do not implement Activity Based Costing System as a part of their management information system. The second Hypothesis is stated as follows:

Hypothesis 2: The Gaza Strip factories do not implement Activity Based Costing System.

4.3 Data Collection

This study is an attempt to examine the adoption of Activity Based Costing and its role in decision making in Gaza Strip factories. Thus, the data to be collected relate to implementation and consonance between expectation and outcomes.

Data can be collected by several ways, direct observation, interviews, and questionnaires, due to the type of data needed to examine the hypothesis; consequently, the questionnaire survey seems to be most appropriate to gather data in the current study because the population consists of all factories located in Gaza Strip.

4.4 Study Population

The study population consist of all the Gaza Strip factories which counts 3825 factories

4.5 Study Sample

The study sample consists of 43 factories from the Gaza Strip factories.

4.6 Variables

Several variables were determined as options of respondents in the questionnaires. These variables can be classified into five categories: factory characteristics; decision making mechanism; accounting and costing systems; ABC implementation; costing method implemented; and cost structure (Table 4.1).

(Table 4.1) Thesis Variable Categories

Category	Variables determined in a questionnaire	Question
1	Factory Characteristics	The first paragraph
2	Decision Making Mechanism	1-21
3	Accounting & Costing Systems	22-40
4	Costing Method Implemented	41
5	Cost Structure	42

The first category was designed to seek general information about respondents and their factories (such as factory name, type of industry, education of the respondent, title of the respondent, work experience, number of employees, capital, number of items and professional factory memberships) the second category is associated with decision making mechanism (such as organizational structure, pricing decisions, costing decisions, organizational structure segments). The third category consists of variables relevant to accounting and costing systems (such as cost allocations, variable and fixed costs, budgeting, inventory valuation, costing objectives). The purpose of Category 4 was to discover data about the implementation of the costing system in the factory. The fifth Category discovers the cost structure in the factory.

4.7 Data Analysis Techniques

Collected data consist of quantitative data gathered by the questionnaire. The quantitative data analysis, together with testing of Hypothesis, involved the use of the Statistical Package for the Social Sciences (SPSS) program for statistical analysis.

Chapter 5

RESULTS, FINDINGS AND DISCUSSIONS

5.1 Introduction

As outlined in Chapter 4, a survey questionnaire was sent to 50 factories in southern Gaza Strip. 43 questionnaires were returned, generating an 86% response rate. In this chapter, the data collected from questionnaires are analyzed and discussed. This chapter describes the individual respondent profiles, factory characteristics and factory environment, as well as ABC implementation. Moreover, an analysis of the relationship between variables based on the sample is provided.

5.2 Study Results

5.2.1 Sample type of industry Classification

(Table 5.1) Industry Classification

Type Of Industry	Number	Percentage
Wood Industries	9	%21
Steel Industries	6	%14
Marble Industries	5	%11

Type Of Industry	Number	Percentage
Plastic Industries	13	%30
Food processing Industries	4	%10
Concrete Industries	4	%10
Textile Industries	2	%4
Total	43	%100

Respondents were asked to classify the type of their factories. As indicate in Table 5.1, in general, there was a spread between a seven classifications of the industries, the major respondents were the Plastic industries which represent a %30 of the total respondent, %10 of respondent were for Food processing and Concrete industries and finally the Textile industries represents %4 of the study sample.

These ratios do not reflect the actual distribution of the industry classification in Gaza Strip.

5.2.2 Sample Factory Experience

(Table 5.2) Factory Experience

Factory Experience	Number	Percentage
Less than 5 years	3	%7
5 years – 10 years	16	%37

Factory Experience	Number	Percentage
11 years – 15 years	9	%21
16 years – 20 years	8	%19
More than 20 years	7	%16
Total	43	%100

When the respondents were asked about the experience of their factories. As indicate in Table 5.2, in general, there was a spread between a five ranges of the industries, %93 of the respondent factories were has a work experience more than 5 years.

5.2.3 Sample Factory Respondent Title

(Table 5.3) Factory Respondent Title

Factory Respondent Title	Number	Percentage
Manager	20	%47
Accountant	14	%33
Supervisor	9	%20
Total	43	%100

Respondents were asked to rank themselves in the factories hierarchy. As indicate in Table 5.3, in general, there was a spread between a three classifications of the job titles, the major respondents were the factory managers.

5.2.4 Sample Factory Respondent Work Experience

(Table 5.4) Factory Respondent Work Experience

Factory Respondent Work Experience	Number	Percentage
Less than 5 years	14	%33
5 years – 10 years	17	%40
11 years – 15 years	2	%4
16 years – 20 years	10	%23
Total	43	%100

Respondents were asked to classify their work experience in the factories. As indicate in Table 5.4, in general, there was a spread between four classifications of the industries, %67 of the respondent factories were has a work experience more than 5 years.

5.2.5 Sample Factory Respondent level of education

(Table 5.5) Factory Respondent level of education

Factory Respondent Job Title	Number	Percentage
Secondary School	15	%35
Diploma	13	%30
Bachelor	15	%35
Total	43	%100

Respondents were asked to classify their level of education. As indicate in Table 5.5, in general, there was a spread between three classifications of the respondent, %65 of the respondents were has a level education of diploma and above.

5.3 Reliability, and Validity

Coefficient Pearson indicates the degree of internal consistency among items in the questionnaire with relation to the thesis variables. Tables 4.6 and 4.7 presents the Pearson coefficient for each key variable used in the statistical analysis. The Table also indicates the descriptive statistics in terms of average scores and range of key variables. The results of these calculations indicate overall reliability of all key variables because the values exceed conventional levels of acceptability.

Table (5.6)

Correlation factor for each paragraph relating to the overall degree

of the Decision Making Mechanism

No.	Paragraph	Correlation Factor	Significance level
A1	Centralized decision-making authority	0.366	0.05
A2	Several hierarchical levels of organizational structure	0.391	0.05
A3	Dependence on regulations or standards of job	0.388	0.05
A4	Product price is determined before production	0.402	0.05
A5	Product Quality is an important element for decision making	0.333	0.05
A6	All costs are included when calculating product cost	0.377	0.05
A7	Costs are calculated accurately when Product/ Product line added	0.425	0.01
A8	After sale service is an important element for decision making	0.434	0.01
A9	Product Pricing is related to Product Cost	0.367	0.05
A10	Product Pricing depends on the dominant market prices	0.495	0.01
A11	Product Pricing depends on the competitors prices and capabilities	0.507	0.01
A12	Indirect costs are allocated to control product cost	0.372	0.05
A13	Indirect costs are allocated to control product price	0.334	0.05

No.	Paragraph	Correlation Factor	Significance level
A14	Indirect costs are allocated to generate external reports	0.525	0.01
A15	Indirect costs are considered for production planning	0.399	0.05
A16	Indirect costs are considered for addition/ deletion product line	0.383	0.05
A17	Indirect costs are considered for evaluation purposes to the departments	0.622	0.01
A18	Indirect costs are considered for evaluation of the chief of departments	0.469	0.01
A19	Organizational structure is organized by functions	0.393	0.05
A20	Organizational structure is organized by product	0.655	0.01
A21	Organizational structure is organized by geographical areas	0.513	0.01

Table (5.7)

Correlation factor for each paragraph relating to the overall degree

of the Accounting & Costing Systems

No.	Paragraph	Correlation factor	Significance level
B22	Accounting Software in use	0.568	0.01
B23	The fixed costs accounts and the variable costs accounts are separated in the COA	0.598	0.01
B24	Budgeting process in place	0.526	0.01
B25	Costing system in place	0.706	0.01
B26	An effecting cost control system in place	0.719	0.01
B27	The accounting system is ABC oriented	0.581	0.01
B28	Direct labor hours is used to allocate the overhead costs	0.581	0.01
B29	Direct working hours is used to allocate the overhead costs	0.508	0.01
B30	Direct material is used to allocate the overhead costs	0.539	0.01
B31	Number of production units is used to allocate the overhead costs	0.389	0.05
B32	Cost accounting system is to support the financial accounting system	0.754	0.01
B33	Cost accounting system is to support the financial reports	0.661	0.01
B34	Cost accounting system is to evaluate the ending inventory	0.396	0.05
B35	Cost accounting system is to determine the products costs	0.708	0.01

No.	Paragraph	Correlation factor	Significance level
B36	Cost accounting system is to accurately determine the products selling price	0.547	0.01
B37	Cost accounting system is to accurately determine the products profitability	0.655	0.01
B38	Cost accounting system is to support the decision making	0.742	0.01
B39	Costs are allocated based on cost of activities	0.623	0.01
B40	Costs are allocated to final products	0.368	0.05

Table (5.8)

Frequencies, Means, Standard Deviation, and weighted average for decision making and Costing systems for n=43

Dimension	No. of Respondents	Average	Standard Deviation	Weighted Average	Rank
Decision Making Mechanism	3139	73.000	8.378	69.524	1
Accounting & Costing Systems	2679	62.302	11.447	65.581	2
Total	5818	135.302	16.618	67.651	

As shown in the above table the decision making mechanism ranked number 1 with weighted average 69.524 while the Accounting & Costing Systems ranked number 2 with weighted average 65.581.

The respondent factories are interested in decision making mechanism more than the accounting and costing system. This result reflects that the factories management needs more awareness to strengthen the concept of using the financial data in decision making.

5.4 Hypothesis- Test Results

In Chapter 4, two Hypotheses concern the implementation of ABC in Gaza Strip factories and decision making. The results of testing these Hypotheses are reported in this section.

Hypothesis 1

It was expected that the current costing system implemented in Gaza Strip factories is not a competent tool for decision making. So, Hypothesis 1 was generated.

Hypothesis 1: The costing systems in the Gaza Strip factories do not provide competent tool for rational decision making.

Table (5.9)

Decision Making Mechanism

No.	Paragraph	No. of resp.	Mean	St. Deviation	Weighted Average	Rank
A5	Product Quality is an important element for decision making	197	4.581	0.545	91.628	1
A6	All costs are included when calculating product cost	179	4.163	0.814	83.256	2
A7	Costs are calculated accurately when Product/ Product line added	179	4.163	0.814	83.256	3
A1	Centralized decision-making authority	174	4.047	1.045	80.930	4
A9	Product Pricing is related to Product Cost	174	4.047	0.899	80.930	5
A3	Dependence on regulations or standards of job	171	3.977	0.597	79.535	6
A8	After sale service is an important element for decision making	169	3.930	0.828	78.605	7
A11	Product Pricing depends on the competitors prices and capabilities	154	3.581	1.052	71.628	8

No.	Paragraph	No. of resp.	Mean	St. Deviation	Weighted Average	Rank
A13	Indirect costs are allocated to control product price	151	3.512	1.032	70.233	9
A4	Product price is determined before production	149	3.465	1.202	69.302	10
A15	Indirect costs are considered for production planning	149	3.465	0.935	69.302	11
A16	Indirect costs are considered for addition/ deletion product line	143	3.326	1.128	66.512	12
A10	Product Pricing depends on the dominant market prices	142	3.302	1.103	66.047	13
A2	Several hierarchical levels of organizational structure	139	3.233	1.288	64.651	14
A12	Indirect costs are allocated to control product cost	138	3.209	0.914	64.186	15
A19	Organizational structure is organized by functions	138	3.209	0.989	64.186	16
A17	Indirect costs are considered for evaluation purposes to the departments	129	3.000	1.113	60.000	17
A20	Organizational structure is organized by product	125	2.907	0.971	58.140	18
A14	Indirect costs are allocated to generate external reports	124	2.884	1.117	57.674	19
A18	Indirect costs are considered for evaluation of the chief of departments	116	2.698	0.939	53.953	20
A21	Organizational structure is organized by geographical areas	99	2.302	1.103	46.047	21

Testing the results indicates that Hypothesis 1 can be accepted, because the most important decisions in Gaza Strip factories are taken for Product Quality, Product Cost, Cost of

Add/delete Product Lines and Product Pricing, consequently costing system is a vital component for the decision makers in helping for rational decision making.

Hypothesis 2

It was expected that the Gaza Strip factories do not implement Activity Based Costing System as a part of their management information system. So, Hypothesis 2 was generated.

Hypothesis 2: The Gaza Strip factories do not implement Activity Based Costing System

Table (5.10)

Costing & Accounting System

No.	Paragraph	No. of resp.	Mean	St. Deviation	Weighted Average	Rank
B37	Cost accounting system is to accurately determine the products profitability	165	3.837	0.871	76.744	1
B35	Cost accounting system is to determine the products costs	162	3.767	0.972	75.349	2
B40	Costs are allocated to final products	160	3.721	0.797	74.419	3
B38	Cost accounting system is to support the decision making	160	3.721	1.008	74.419	4
B22	Accounting Software in use	151	3.512	1.470	70.233	5
B36	Cost accounting system is to accurately determine the products selling price	149	3.465	1.099	69.302	6
B28	Direct labor hours is used to allocate the overhead costs	146	3.395	1.027	67.907	7
B32	Cost accounting system is to support the financial accounting system	146	3.395	0.929	67.907	8
B30	Direct material is used to allocate the overhead costs	141	3.279	0.908	65.581	9
B31	Number of production units is used to allocate the overhead costs	138	3.209	0.888	64.186	10
B23	The fixed costs accounts and the variable costs accounts are separated in the COA	137	3.186	0.982	63.721	11
B25	Costing system in place	136	3.163	1.045	63.256	12

No.	Paragraph	No. of resp.	Mean	St. Deviation	Weighted Average	Rank
B33	Cost accounting system is to support the financial reports	135	3.140	0.990	62.791	13
B34	Cost accounting system is to evaluate the ending inventory	135	3.140	1.125	62.791	14
B29	Direct working hours is used to allocate the overhead costs	133	3.093	1.019	61.860	15
B26	An effecting cost control system in place	132	3.070	0.961	61.395	16
B39	Costs are allocated based on cost of activities	128	2.977	0.988	59.535	17
B27	The accounting system is ABC oriented	114	2.651	1.066	53.023	18
B24	Budgeting process in place	111	2.581	1.096	51.628	19

Testing the results indicates that Hypothesis 2 can be accepted, the costing system used in Gaza Strip factories depends on traditional costing systems whereas Activity Based Costing system is not adapted as a tool for generating reports for rational decision making.

Also, from the above table we can prioritize the aspects of using the accounting and costing systems as the following:

1. Cost accounting system is to accurately determine the products profitability.
2. Cost accounting system is to determine the products costs.
3. Costs are allocated to final products.
4. Cost accounting system is to support the decision making.

The major use of the accounting and costing system mainly to determine the net income of the factory which reflects the performance of the factory; whereas the decision making support by the accounting and costing system is not a major issue in this regard.

5.5 Testing Hypotheses according to Industry Classification Variable

To verify the hypothesis results the researcher uses the One Way ANOVA test and the results were as follows:

Table (5.11): ANOVA Table for result of F test for Industry Classification

Dimensions	Source	Sum of Squares	DF	Mean Square	F	Sig Level
Decision Making Mechanism	Between	741.603	6	123.601	2.017	No Significant difference
	Within	2206.397	36	61.289		
	Total	2948.000	42			
Accounting & Costing Systems	Between	1006.177	6	167.696	1.342	No Significant difference
	Within	4496.892	36	124.914		
	Total	5503.070	42			
Total	Between	2046.591	6	341.099	1.285	No Significant difference
	Within	9552.479	36	265.347		
	Total	11599.070	42			

F Value for Degrees of Freedom (6,36) and significant level (0.05) = 2.32

From the above table we note that the calculated F value is less than the tabular F at significance level (0.05).

Testing Hypothesis 1 according to Industry Classification shows that there is no significant difference between the variables, all industry sectors had the same response in the field of decision making mechanism they all had positive declare that their costing systems did not provide competent tool for decision making.

Also, in testing Hypothesis 2 according to Industry Classification, shows that there is no significant difference for between the variables, all industry sectors had the same response in the field of accounting and costing systems they all had positive declare that they did not implement the Activity Based Costing system in their accounting and costing systems.

Table (5.12): ANOVA Table for result of F test for factory experience

Dimensions	Source	Sum of Squares	DF	Mean Square	F	Sig Level
Decision Making Mechanism	Between	180.349	4	45.087	0.619	No Significant difference
	Within	2767.651	38	72.833		
	Total	2948.000	42			
Accounting & Costing Systems	Between	1312.106	4	328.027	2.974	Significant difference
	Within	4190.963	38	110.289		
	Total	5503.070	42			
Total	Between	1480.821	4	370.205	1.390	No Significant

Dimensions	Source	Sum of Squares	DF	Mean Square	F	Sig Level
	Within	10118.249	38	266.270		
	Total					

F Value for Degrees of Freedom (4,38) and significant level (0.05) = 2.59

From the above table we note that the calculated F value is less than the tabular F at significance level (0.05) for testing Decision Making Mechanism while there is significant difference for Accounting and costing systems.

Testing Hypothesis 1 according to factory experience shows that there is no significant difference between the variables, all factories had the same response in the field of decision making mechanism they all had positive declare that their costing systems did not provide competent tool for decision making.

Whereas, in testing Hypothesis 2 according to factory experience, shows that there is significant difference for between the variables, so the researcher use the Scheffee test to observe the differences directions

Table (5.13) Scheffee test results to define the differences directions

Over 20 years M=71.286	**From 16-20 years M=53.375**	**From 11-15 years M=65.444**	**From 5-10 years M=61.313**	**Less than 5 years M=61**	
–	–	–	–	–	**Less than 5 years M=61**
–	–	–	–	0.313	**From 5-10 Years M=61.313**
–	–	–	4.132	4.444	**From 11-15 Years M=65.444**
–	–	12.07	7.938	7.635	**From 16-20 Years M=53.375**
–	*17.91	5.29	4.76	7.25	**Over 20 Years M=71.286**

From the above table we note that there is a significance differences for factories experienced ranged from 16-20 years and the factories that had more than 20 years of experience, and there are no differences in the other categories.

Table (5.14): ANOVA Table for result of F test for

Factory Respondent Job Title

Dimensions	Source	Sum of Squares	DF	Mean Square	F	
Decision	Between	148.528	2	74.264	1.061	No

Dimensions	Source	Sum of Squares	DF	Mean Square	F	
Making Mechanism	Within	2799.472	40	69.987		Significant difference
	Total	2948.000	42			
Accounting & Costing Systems	Between	341.040	4	170.520	1.321	No Significant difference
	Within	5162.029	40	129.051		
	Total	5503.070	42			
Total	Between	465.513	2	232.756	0.836	No Significant difference
	Within	11133.557	40	278.339		
	Total	11599.070	42			

F Value for Degrees of Freedom (2,40) and significant level (0.05) = 3.22

From the above table we note that the calculated F value is less than the tabular F at significance level (0.05).

Testing Hypothesis 1 according to factory respondent job title shows that there is no significant difference between the variables, all the factory respondents job title had the same response in the field of decision making mechanism they all had positive declare that their costing systems did not provide competent tool for decision making.

Also, in testing Hypothesis 2 according to factory respondent job title, shows that there is no significant difference for between the variables, all factory respondent jobs title had the same response in the field of accounting and costing systems they all had positive declare

that they did not implement the Activity Based Costing system in their accounting and costing systems.

Table (5.15): ANOVA Table for result of F test for

Factory Respondent experience

Dimensions	Source	Sum of Squares	DF	Mean Square	F	Sig
Decision Making Mechanism	Between	54.356	3	18.119	0.244	No Significant difference
	Within	2893.644	39	74.196		
	Total	2948.000	42			
Accounting & Costing Systems	Between	323.083	3	107.694	0.811	No Significant difference
	Within	5179.987	39	132.820		
	Total	5503.070	42			
Total	Between	287.124	3	95.708	0.330	No Significant difference
	Within	11311.946	39	290.050		
	Total	11599.070	42			

F Value for Degrees of Freedom (3,39) and significant level (0.05) = 2.83

From the above table we note that the calculated F value is less than the tabular F at significance level (0.05).

Testing Hypothesis 1 according to factory respondent experience shows that there is no significant difference between the variables, all the factory respondents experience had the

same response in the field of decision making mechanism they all had positive declare that their costing systems did not provide competent tool for decision making.

Also, in testing Hypothesis 2 according to factory respondent experience shows that there is no significant difference for between the variables, all factory respondent experience had the same response in the field of accounting and costing systems they all had positive declare that they did not implement the Activity Based Costing system in their accounting and costing systems.

Table (5.16): ANOVA Table for result of F test for

Factory Respondent Level of Education

Dimensions	Source	Sum of Squares	DF	Mean Square	F	Sig
Decision Making Mechanism	Between	184.944	2	92.472	1.339	No Significant difference
	Within	2763.056	40	69.076		
	Total	2948.000	42			
Accounting & Costing Systems	Between	53.860	2	26.930	0.198	No Significant difference
	Within	5449.210	40	136.230		
	Total	5503.070	42			
Total	Between	526.906	2	213.453	0.764	No Significant difference
	Within	11172.164	40	279.304		
	Total	11599.070	42			

F Value for Degrees of Freedom (2,40) and significant level (0.05) = 2.83

From the above table we note that the calculated F value is less than the tabular F at significance level (0.05).

Testing Hypothesis 1 according to factory respondent level of education shows that there is no significant difference between the variables, all the factory respondents experience had the same response in the field of decision making mechanism they all had positive declare that their costing systems did not provide competent tool for decision making.

Also, in testing Hypothesis 2 according to factory respondent level of education shows that there is no significant difference for between the variables, all factory respondent experience had the same response in the field of accounting and costing systems they all had positive declare that they did not implement the Activity Based Costing system in their accounting and costing systems.

Respondent Factory product costing methods:

Table (5.17)

Factory product costing methods

Costing Method	Frequency	Percentage
Traditional Costing	42	97.67
Variable Costing	17	39.53
Activity Costing	10	23.26
Standard Costing	11	25.58
Job Costing	11	25.58
Process Costing	9	20.93

The previous table shows that most of the factories uses the traditional costing system, meaning that all the products had the same method of cost allocation, despites of the level of activity that had been consumed by the product, this result emphasis hypothesis 2 which proposes that Gaza factories does not implement Activity based costing; while the other costing methods are used with a less degree of the traditional costing method.

The break down total company costs into the following categories

Table (5.18)

Factory product costing breakdown

Costing Category	No. of Respondent	Percentage
Direct Material	2661	61.88
Direct labor	713	16.58
Indirect Overhead	426	9.91
Other Indirect Costs	500	11.63
Total	4300	100

From the above table, we note that the direct costs represents about 78% of the total costs of the product costs, while on the other hand the overhead costs represents about 22% of the total products costs which is the research is focus on, this research studies Activity Based Costing which is specifically studies 22% of the total product costs.

Chapter 6

CONCLUSIONS

6.1 Conclusions

This thesis demonstrates the level of implementation of the Activity Based Costing in the Gaza Strip factories and its role in Decision Making mechanism, the decisions are taken for Product Quality, Product Cost, Cost of Add/delete Product line, and Product Pricing.

The results of the study ranked the important in decision making elements for the Gaza Strip factories are as the following:

1. Decisions related to the Product Quality.
2. Decisions related to total product costing.
3. Decisions related to the centralized decision making.
4. Decision related to the product pricing.

Of course, the above Decision Making elements are not the only decisions that had been taken in Gaza Strip factories but these elements are mainly the type of decisions related to the implementation of costing systems.

On the other hand, the study shows that costing and accounting system used in Gaza Strip factories are mainly for following:

1. To determine the products profitability.
2. To determine the products costs.
3. To allocate costs to the final products.
4. To support decision making.

The study also shows that the factories are not using the ABC to support decision making, while the factories uses other costing system in order to support decision making mechanism.

The study also shows that most of the Gaza Strip factories use Traditional Costing System, while other systems are used in less degree; The Activity Based Costing System is not used in adequate manner this is reflected due to ignorant of factories to this type of costing system.

In this study, the indirect costs of the products are composes about 22% of the total product costs, meaning that this study focuses to research about 22% of the product costs in Gaza Strip factories.

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